
Regional Natural Hazard Workbook

2020 Pre-Disaster Hazard Mitigation Update

Laketown

Introduction

Purpose of the Workbook:

- To identify and understand natural hazards in your jurisdiction
- To understand the risk and potential losses of natural hazard events
- To develop mitigation strategies to reduce or eliminate potential losses

Content of Each Natural Hazard Section:

- A description of the natural hazard
- A map of the extent of a moderate to extreme natural hazard event (risk)
- A table of potential losses and value
- A space to develop strategies (additional spaces in back of workbook), including the action, priority, timeframe, potential funding sources, responsible entity, estimated cost, and resources

Directions:

1. Review each natural hazard in your community
2. Develop at least one strategy for current residents and property and one for future residents and property for each hazard. Each strategy must include:
 - The Action: Review the Mitigation Strategy Guide for example actions
 - Be as specific as possible with the action, for example:
Earthquake: Seismic retrofit Holden Town Hall
Flood: Replace current 15" culverts along 100 East, 200 East and 100 South with 24" diameter culverts
 - NFIP Compliance for Flood Mitigation Strategy: How would this action help your jurisdiction comply with the National Flood Insurance Program (NFIP) status
 - Priority Level: Is the action high, medium or low priority?
 - Timeframe: When will the action be completed by? (year)
 - Potential Funding Sources: How will the project be funded? Not sure, we can help fill this in later
 - Responsible Entity: Who will ensure this action is carried out?
 - Estimated Cost: How much will the action cost? Not sure, put your best guess, or at minimum will the cost be high, medium or low?
 - Resources: Who can help carry out the action?

Values

Housing unit value was derived from 2019 local county assessor data for the average value of a residential property, including building and land, in the city/town. Commercial value was derived from 2019 local county assessor data for the average value of a commercial business, including building and land, in the city/town. Local road values were derived from estimates from local county roads department for an average 28" wide 4" thick asphalt county road with gravel subgrade replacement (\$525,000).

Disclaimer

The maps in this workbook are for informational purposes only and is not intended for legal, engineering, or surveying purposes. Users should consult with primary data sources for additional information or to obtain more accurate data, if available. BRAG and SCAOG shall not be held liable for any errors or inaccuracies that may occur. Neither do they accept liability for any consequences that may result from use of the data.

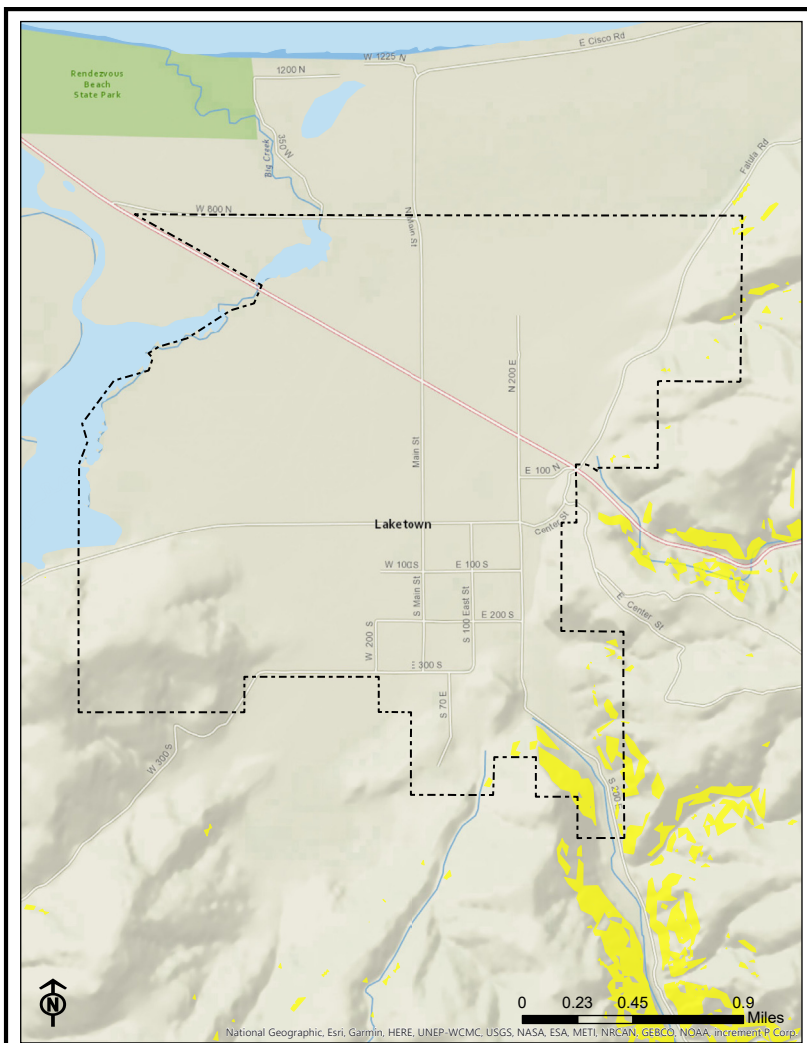
LAKETOWN- COMMUNITY MITIGATION STRATEGIES										
Protecting Current Residents and Property										
Jurisdiction	Hazard	Goal	Action	Action (For NFIP Compliance, if Applicable)	Priority (High, Medium, Low)	Time-frame (Year)	Potential Funding Sources	Responsible Entity	Estimated Cost	Resources
Laketown	Wildfire	Protect current residents and property	Create fire break on east side of town	N/A	Medium	2018	PDMG, USFS, FFSL	Laketown, Utah FFSL	TBD	Local, Utah FFSL, County
Laketown	Flood	Protect current residents and property	Determine flood risk based on historical data and available mapping to avoid loss.	Work with state floodplain manager to assure compliance with NFIP	Medium	2017	Local	Laketown, Utah DEM	Minimal	Utah DEM, FEMA, BRAG
Laketown	Landslide	Protect current residents and property	Determine landslide risk based on historical data and available mapping to avoid loss.	N/A	Medium	2017	Local	Laketown, UGS	Minimal	UGS, USGS, BRAG
Laketown	Earthquake/ Faults	Protect current residents and property	Update Geological Mapping	N/A	Medium	2020	UGS, FEMA, BRAG	Laketown, UGS	Minimal	BRAG, USU, UGS, USGS
Laketown	Steep Slopes	Protect current residents and property	Update Geological Mapping	N/A	Medium	2020	UGS, FEMA, BRAG	Laketown, UGS	Minimal	BRAG, USU, UGS, USGS
LAKETOWN- COMMUNITY MITIGATION STRATEGIES										
Protecting Future Residents and Property										
Jurisdiction	Hazard	Goal	Action	Action (For NFIP Compliance, if Applicable)	Priority (High, Medium, Low)	Time-frame (Year)	Potential Funding Sources	Responsible Entity	Estimated Cost	Resources
Laketown	Wildfire	Protect future residents and property	Create fire break on east side of town	N/A	Medium	2018	PDMG, USFS, FFSL	Laketown, Utah FFSL	TBD	Local, Utah FFSL, County
Laketown	Flood	Protect future residents and property	Review current ordinances to determine if improvements need to be made to protect future residents.	Work with state floodplain manager to assure compliance with NFIP	Medium	2017	Local	Laketown, Utah DEM	Minimal	Utah DEM, FEMA, BRAG
Laketown	Landslide	Protect future residents and property	Review current ordinances to determine if improvements need to be made to protect future residents.	N/A	Medium	2017	Local	Laketown, UGS	Minimal	UGS, USGS, BRAG
Laketown	Earthquake/ Faults	Protect future residents and property	Update Geological Mapping	N/A	Medium	2020	UGS, FEMA, BRAG	Laketown, UGS	Minimal	BRAG, USU, UGS, USGS
Laketown	Steep Slopes	Protect future residents and property	Update Geological Mapping	N/A	Medium	2020	UGS, FEMA, BRAG	Laketown, UGS	Minimal	BRAG, USU, UGS, USGS

Avalanche Terrain

Hazard Description: An avalanche is a mass of snow, ice, and debris that slides rapidly down steep mountain slopes at speeds up to 80 mph when triggered by ground shaking, sound, or movement. Dry or slab avalanches are the most common and the deadliest in Utah. They are triggered when heavy snow is rapidly added to weaker layers. Wet avalanches occur during spring thaw events.

Avalanches pose a significant hazard in Utah's mountains between the months of January and April, seasons of heavy snow accumulation and unstable snowpack conditions. Weather, terrain, topography, and snow conditions also impact avalanche activity.

Map Description: This map display areas of avalanche terrain based on areas with slope between 35° to 40°, low profile and bare ground vegetation, and elevation above 5,500 feet.



Legend

 Avalanche Terrain Area Jurisdictional Boundary

Avalanche

Protecting **Current** Residents and Property

Action	
How is action NFIP Compliant?	
Priority (High, Medium, Low)	
Timeframe (Year)	
Potential Funding Sources	
Responsible Entity	
Estimated Cost	
Resources	

Protecting **Future** Residents and Property

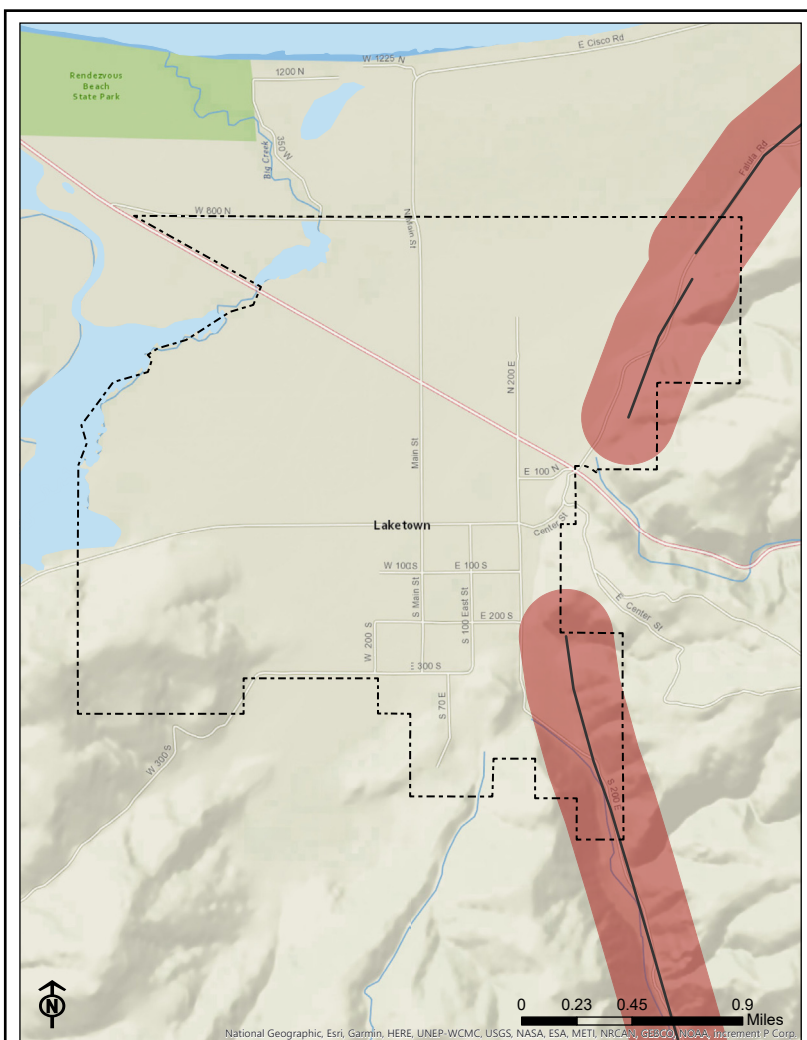
Action	
How is action NFIP Compliant?	
Priority (High, Medium, Low)	
Timeframe (Year)	
Potential Funding Sources	
Responsible Entity	
Estimated Cost	
Resources	

Earthquake

Hazard Description: Any sudden shaking of the ground caused by seismic waves through the Earth's rocks constitutes an earthquake. Seismic waves are produced when some form of energy stored in Earth's crust is suddenly released, usually when masses of rock straining against one another suddenly fracture and "slip." Earthquakes occur most often along geologic faults, narrow zones where rock masses move in relation to one another. The major fault lines of the world are located at the fringes of the huge tectonic plates that make up Earth's crust.

Certain saturated soft soil can take on the characteristics of a fluid when shaken by an earthquake, resulting in a state called liquefaction. Amplified shaking also results in areas of “soft soils” which includes fill, loose sand, waterfront, and lake bed clays.

Map Description: This map displays the earthquake damage zone (1,500 foot buffer on either side of the quaternary fault) as recommended by the Utah Geological Survey. For more information visit: <https://geology.utah.gov/apps/qfaults/index.html>



Legend

-  Quaternary Fault  Jurisdictional Boundary
 Earthquake Damage Zone

Data Source: Utah Geologic Survey (2019) Quaternary Faults

Earthquake

Protecting **Current** Residents and Property

Action	
How is action NFIP Compliant?	
Priority (High, Medium, Low)	
Timeframe (Year)	
Potential Funding Sources	
Responsible Entity	
Estimated Cost	
Resources	

Protecting **Future** Residents and Property

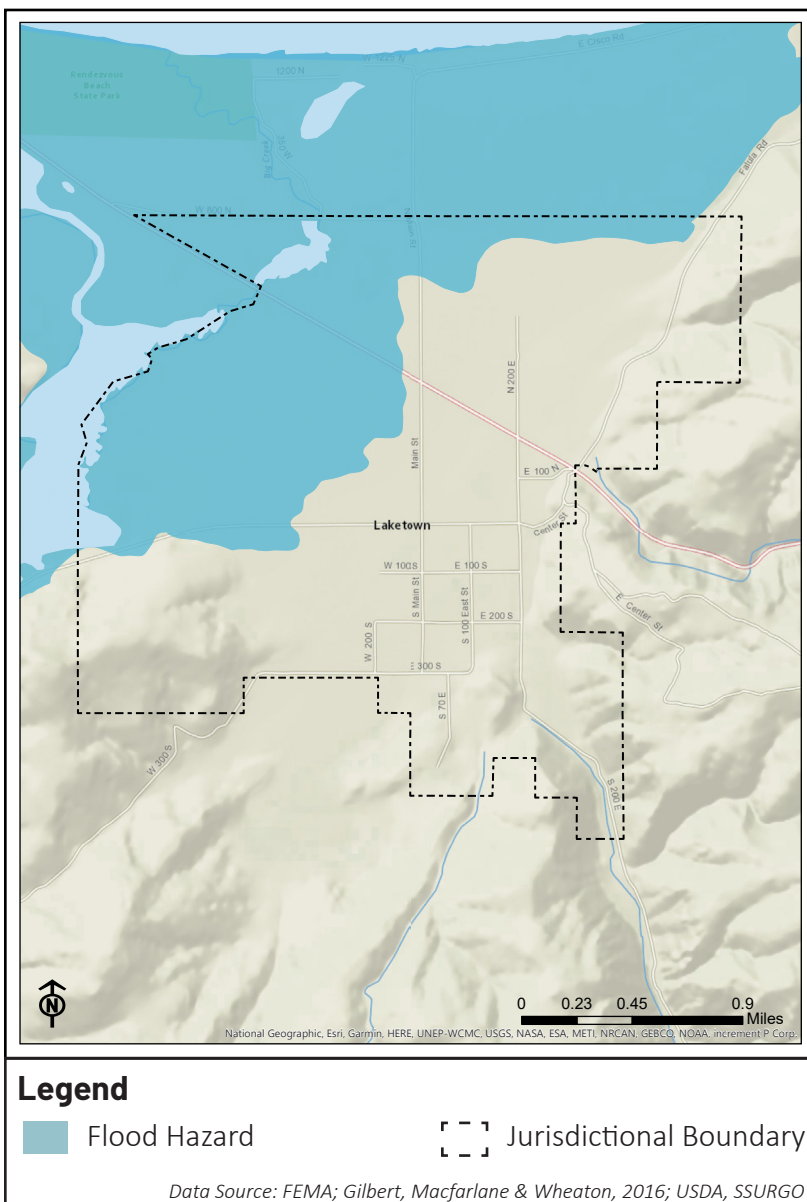
Action	
How is action NFIP Compliant?	
Priority (High, Medium, Low)	
Timeframe (Year)	
Potential Funding Sources	
Responsible Entity	
Estimated Cost	
Resources	

Flood - Soil

Hazard Description: A flood is an overflow of water from rivers, groundwater, or rainfall that submerges areas that are usually dry. The most common cause of flooding is due to rain or snowmelt that accumulates faster than soils can absorb it or rivers can carry it away. Flooding can also result from the failure of a water control structure, such as a levee or dam (see also Dam Failure).

A 1% Annual Chance Flood, or 100-year flood, is a flood that has a 1 percent chance or greater of occurring in any given year. Experiencing a 100-year flood does not decrease the chance of a second 100-year flood occurring that same year or any year that follows. A 100-year flood today, independent of future sea level rise and other climate change effects, has a 26 percent chance of occurring over the life of a 30-year mortgage. Similarly, a 100-year flood today has a 45 percent chance of occurring over the 60-year life of a power substation.

Map Description: This map displays the 100 year floodplain based on NRCS soil survey data (<https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/>) and was identified based on research by Sangway and Merwade (<https://onlinelibrary.wiley.com/doi/abs/10.1111/1752-1688.12306>).

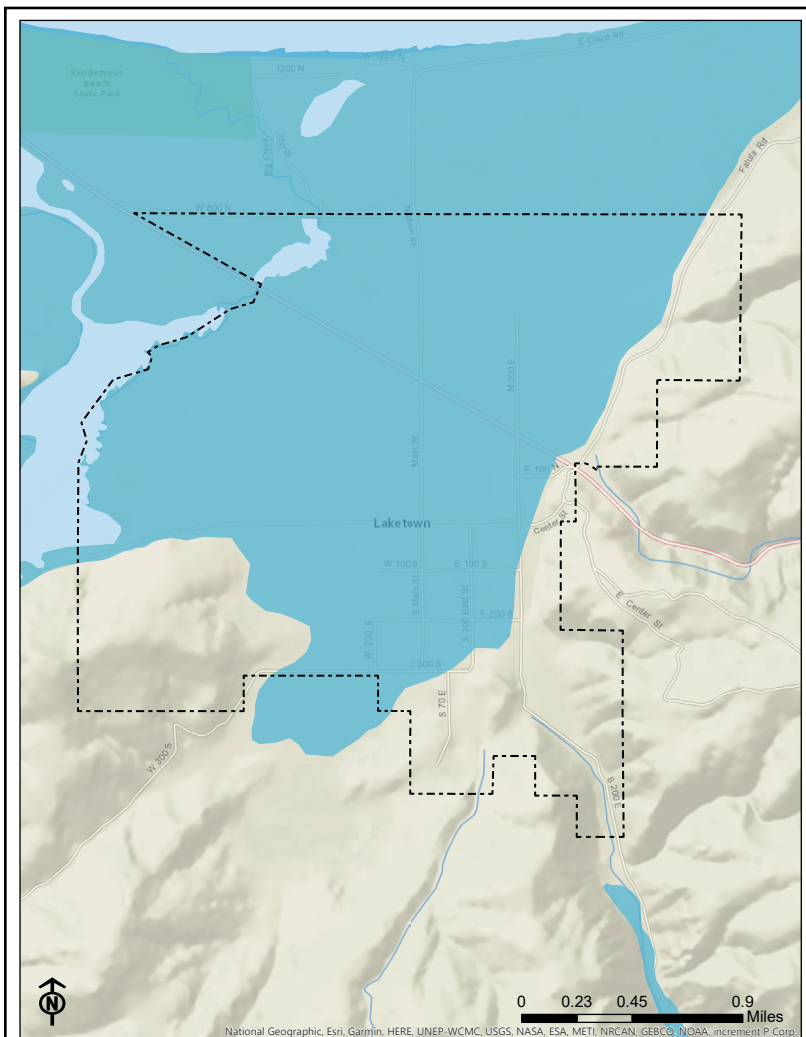


Flood – Valley Bottom

Hazard Description: A flood is an overflow of water from rivers, groundwater, or rainfall that submerges areas that are usually dry. The most common cause of flooding is due to rain or snowmelt that accumulates faster than soils can absorb it or rivers can carry it away. Flooding can also result from the failure of a water control structure, such as a levee or dam (see also Dam Failure).

A 1% Annual Chance Flood, or 100-year flood, is a flood that has a 1 percent chance or greater of occurring in any given year. Experiencing a 100-year flood does not decrease the chance of a second 100-year flood occurring that same year or any year that follows. A 100-year flood today, independent of future sea level rise and other climate change effects, has a 26 percent chance of occurring over the life of a 30-year mortgage. Similarly, a 100-year flood today has a 45 percent chance of occurring over the 60-year life of a power substation.

Map Description: The valley bottom map displays the potential flood plain based on stream networks and elevation data (<https://databasin.org/datasets/95a24aef6a24996bf8082090fddb831>).



Legend

Flood Hazard

Jurisdictional Boundary

Data Source: FEMA; Gilbert, Macfarlane & Wheaton, 2016; USDA, SSURGO

Flood

Protecting **Current** Residents and Property

Action	
How is action NFIP Compliant?	
Priority (High, Medium, Low)	
Timeframe (Year)	
Potential Funding Sources	
Responsible Entity	
Estimated Cost	
Resources	

Protecting **Future** Residents and Property

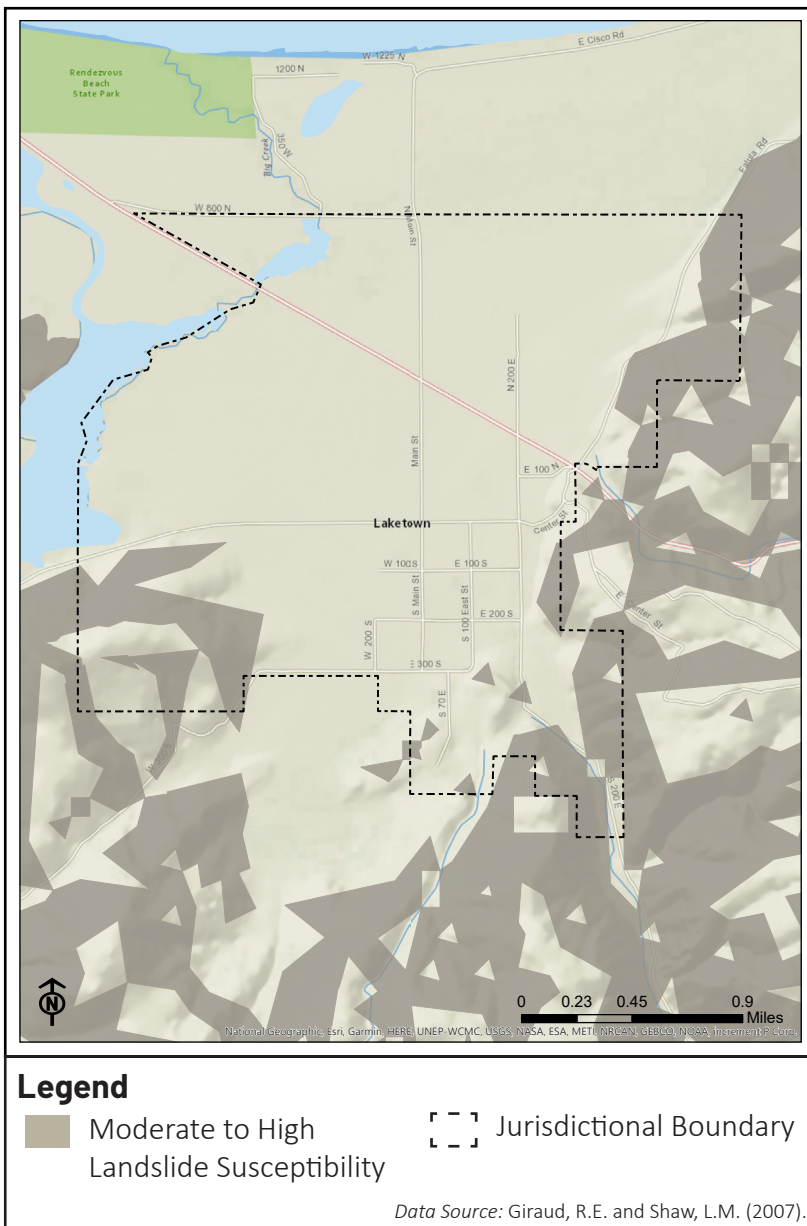
Action	
How is action NFIP Compliant?	
Priority (High, Medium, Low)	
Timeframe (Year)	
Potential Funding Sources	
Responsible Entity	
Estimated Cost	
Resources	

Landslide

Hazard Description: A landslide is the movement of a mass of rock, debris, or earth down a slope by force of gravity. They flow rapidly, striking at avalanche speeds that can travel several miles, growing in size as they pick up trees, boulders, cars and other materials.

Landslides occur when the slope or soil stability changes from stable to unstable, which may be caused by earthquakes, storms, volcanic eruptions, erosion, fire, or additional human-induced activities. Slopes greater than 10 degrees are more likely to slide, as are slopes where the height from the top of the slope to its toe is greater than 40 feet. Slopes are also more likely to fail if vegetative cover is low and/or soil water content is high. However, landslides can occur with very little slope, sometimes classified as earth slumping or earth flow.

Hazard Description: This map displays moderate to high landslide susceptibility based on research completed by Utah Geological Survey geologists. For more information visit: <https://ugspub.nr.utah.gov/publications/maps/m-228/m-228.pdf>



Landslide

Protecting **Current** Residents and Property

Action	
How is action NFIP Compliant?	
Priority (High, Medium, Low)	
Timeframe (Year)	
Potential Funding Sources	
Responsible Entity	
Estimated Cost	
Resources	

Protecting **Future** Residents and Property

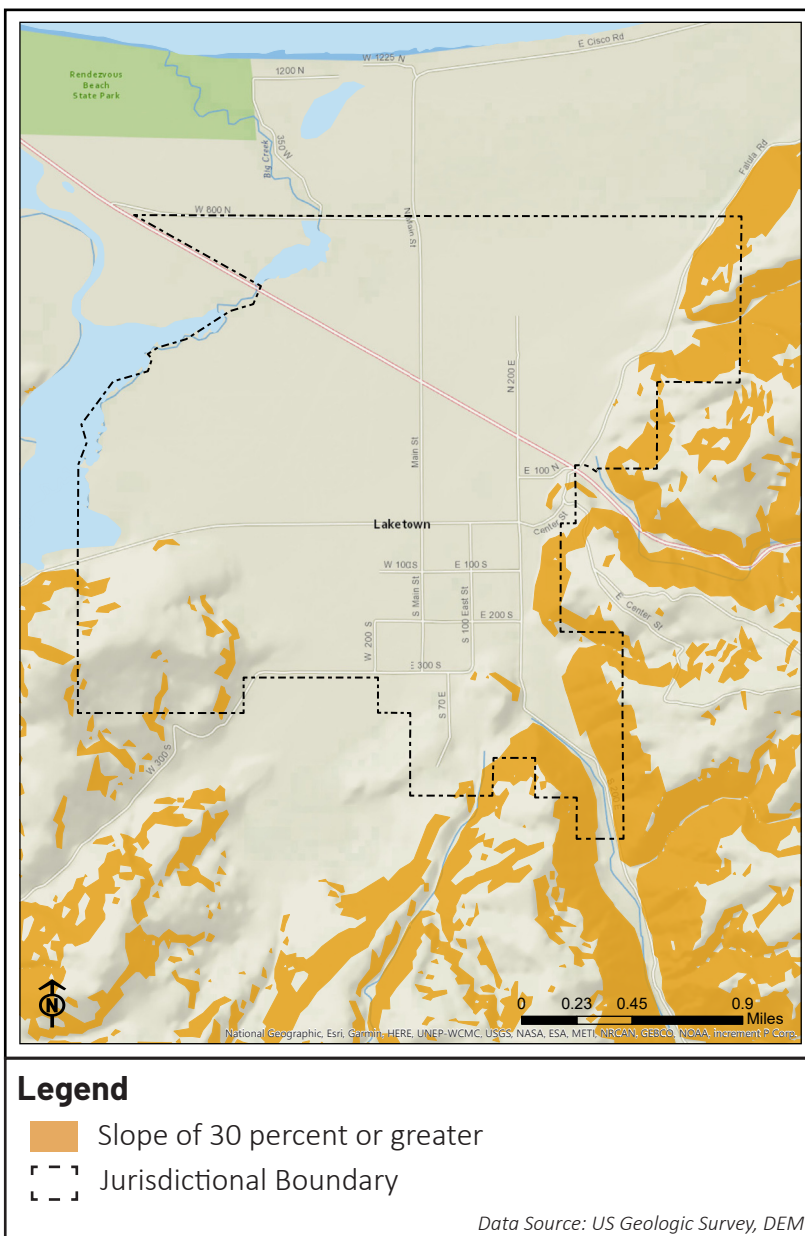
Action	
How is action NFIP Compliant?	
Priority (High, Medium, Low)	
Timeframe (Year)	
Potential Funding Sources	
Responsible Entity	
Estimated Cost	
Resources	

Steep Slope

Hazard Description: A landslide is the movement of a mass of rock, debris, or earth down a slope by force of gravity. They flow rapidly, striking at avalanche speeds that can travel several miles, growing in size as they pick up trees, boulders, cars and other materials.

Landslides occur when the slope or soil stability changes from stable to unstable, which may be caused by earthquakes, storms, volcanic eruptions, erosion, fire, or additional human-induced activities. Slopes greater than 10 degrees are more likely to slide, as are slopes where the height from the top of the slope to its toe is greater than 40 feet. Slopes are also more likely to fail if vegetative cover is low and/or soil water content is high. However, landslides can occur with very little slope, sometimes classified as earth slumping or earth flow.

Hazard Description: This map displays areas of steep slopes (30 percent slope or greater) and was developed using the U.S. Geologic Survey National Elevation Dataset. For more information visit: <https://www.usgs.gov/core-science-systems/national-geospatial-program/national-map>



Steep Slope

Protecting **Current** Residents and Property

Action	
How is action NFIP Compliant?	
Priority (High, Medium, Low)	
Timeframe (Year)	
Potential Funding Sources	
Responsible Entity	
Estimated Cost	
Resources	

Protecting **Future** Residents and Property

Action	
How is action NFIP Compliant?	
Priority (High, Medium, Low)	
Timeframe (Year)	
Potential Funding Sources	
Responsible Entity	
Estimated Cost	
Resources	

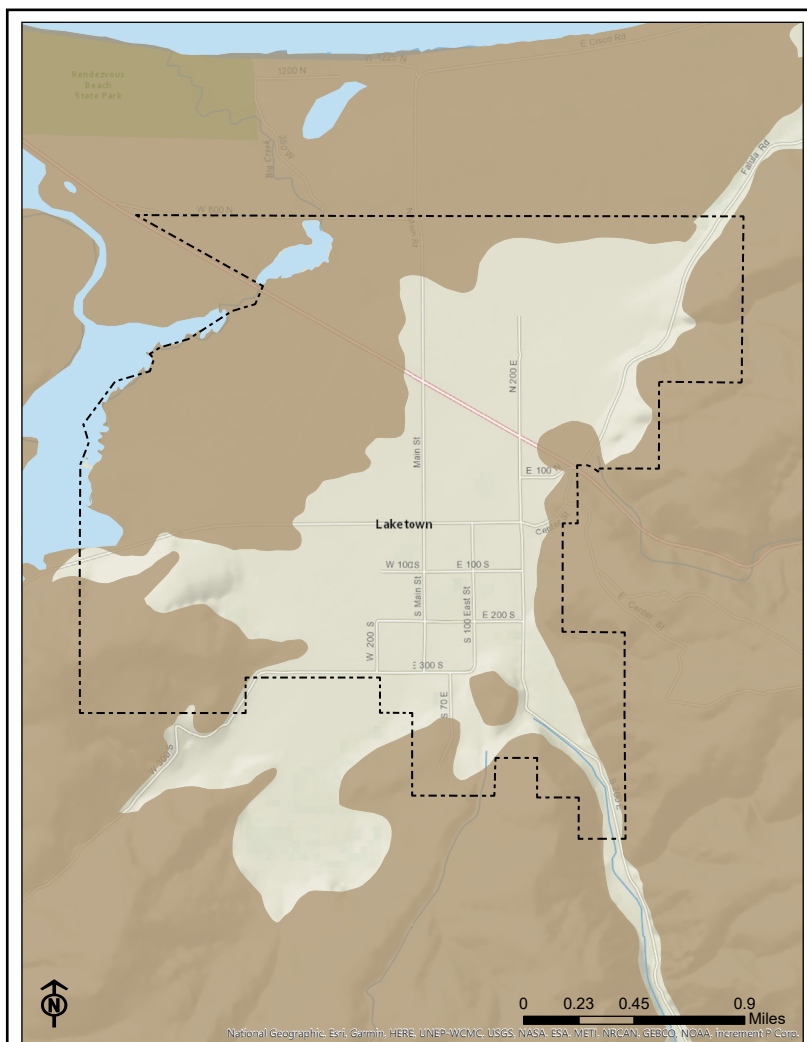
Problem Soils (with basements)

Hazard Description: Problem soils are a group of hazards related to the specific properties of soils, and can include:

- Collapsible soil: Soils that have considerable strength when in a dry, natural state, but significantly settle due to hydrocompaction (reduction of air space within the soil) when wetted;
- Expansive soil: Soil with high clay content that swells when wet and shrinks when dried; and
- Subsidence : Sinking of the ground caused by groundwater depletion and/or underground mine subsidence or collapse

Problem soils can cause extensive damage to structures and foundations, and may also damage pavements after construction. They have caused an undetermined, but very significant amount of infrastructure damage and resulting economic impact.

Map Description: This map displays soils not suitable for dwellings with basements based on soil parameters (see reference section USDA SSURGO 1. Soils Not Suitable for Dwellings with Basements for more information).



Legend

- Soils Not Suitable for Dwellings with Basements
- Jurisdictional Boundary

Data Source: SSURGO Database, National Resources Conservation Service (NRCS)

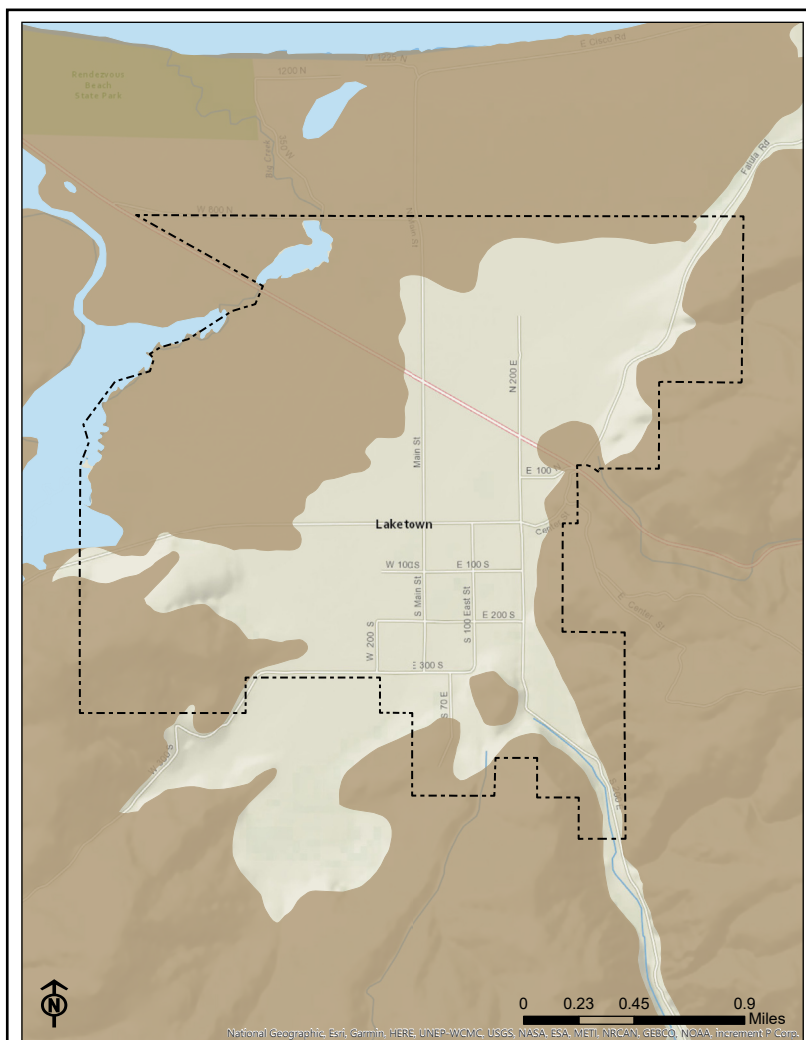
Problem Soils (without basements)

Hazard Description: Problem soils are a group of hazards related to the specific properties of soils, and can include:

- Collapsible soil: Soils that have considerable strength when in a dry, natural state, but significantly settle due to hydrocompaction (reduction of air space within the soil) when wetted;
- Expansive soil: Soil with high clay content that swells when wet and shrinks when dried; and
- Subsidence : Sinking of the ground caused by groundwater depletion and/or underground mine subsidence or collapse

Problem soils can cause extensive damage to structures and foundations, and may also damage pavements after construction. They have caused an undetermined, but very significant amount of infrastructure damage and resulting economic impact.

Map Description: This map displays soils not suitable for dwellings without basements based on soil parameters (see reference section USDA SSURGO 2. Soils Not Suitable for Dwellings without Basements for more information).



Legend

- Soils Not Suitable for Dwellings without Basements
 Jurisdictional Boundary

Data Source: SSURGO Database, National Resources Conservation Service (NRCS)

Problem Soil

Protecting **Current** Residents and Property

Action	
How is action NFIP Compliant?	
Priority (High, Medium, Low)	
Timeframe (Year)	
Potential Funding Sources	
Responsible Entity	
Estimated Cost	
Resources	

Protecting **Future** Residents and Property

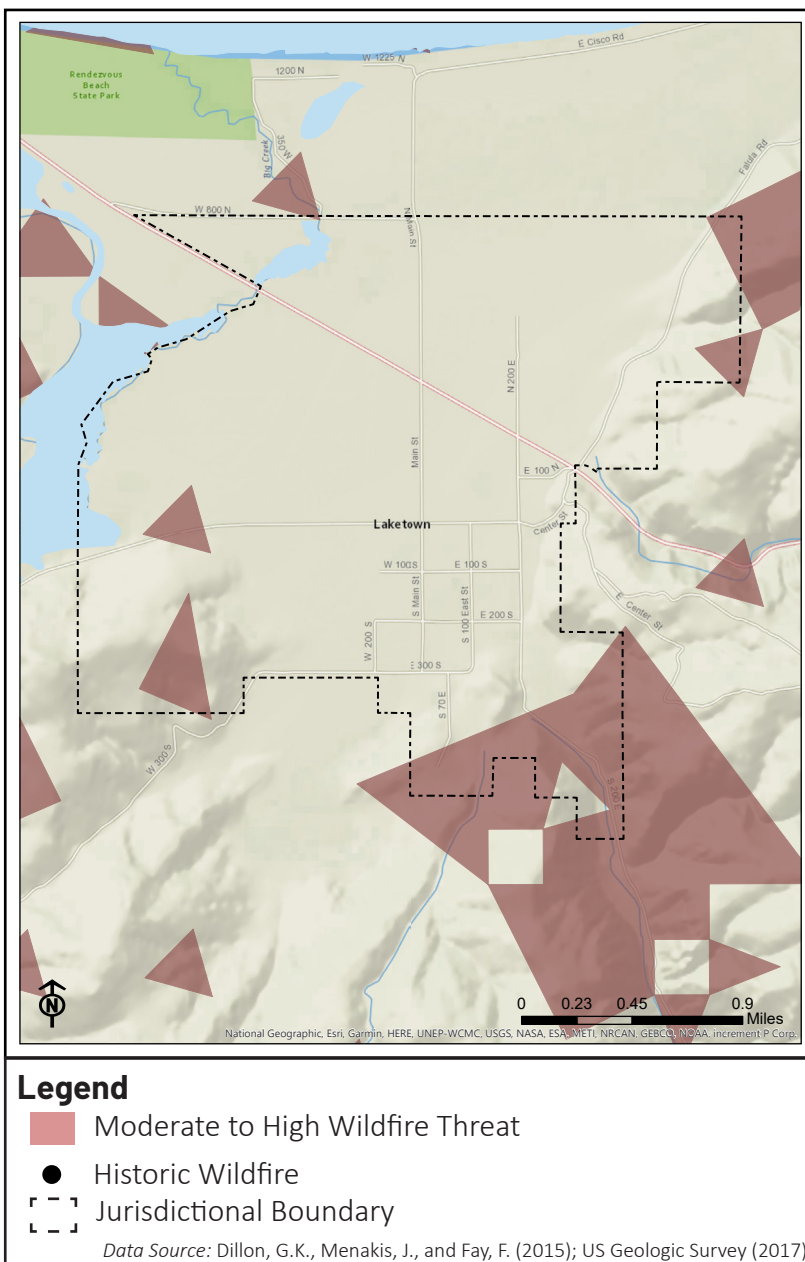
Action	
How is action NFIP Compliant?	
Priority (High, Medium, Low)	
Timeframe (Year)	
Potential Funding Sources	
Responsible Entity	
Estimated Cost	
Resources	

Wildfire - US Forest Service

Hazard Description: A wildfire is any outdoor fire that is not controlled, supervised, or arranged. Wildfire probability depends on fuel, weather and topography. Wildfires can occur in the wildland or the wildland urban interface. A wildland is an area where development is almost nonexistent, except for roads, railroads, or power lines. Wildland urban interface is an area where structures and other human development meet or intermingle with wildland or vegetation fuels.

Fuels are anything that will burn and include vegetation and structures. The weather, such as high temperatures, low humidity and high winds increase the likelihood that a wildfire will spread. Topography affects speed at which a wildfire will spread. A fire will move more quickly uphill which causes hot gases to rise in front of it. These gases in turn, pre-heat and dry vegetation ahead of the wildfire causing it to catch fire more rapidly.

Hazard Description: This map displays areas of moderate to high wildfire hazard potential developed by the U.S. Forest Service and historical wildfire occurrences from 1980-2016. For more information visit: <https://www.firelab.org/project/wildfire-hazard-potential>



Wildfire

Protecting **Current** Residents and Property

Action	
How is action NFIP Compliant?	
Priority (High, Medium, Low)	
Timeframe (Year)	
Potential Funding Sources	
Responsible Entity	
Estimated Cost	
Resources	

Protecting **Future** Residents and Property

Action	
How is action NFIP Compliant?	
Priority (High, Medium, Low)	
Timeframe (Year)	
Potential Funding Sources	
Responsible Entity	
Estimated Cost	
Resources	

Protecting **Current** Residents and Property

Action	
How is action NFIP Compliant?	
Priority (High, Medium, Low)	
Timeframe (Year)	
Potential Funding Sources	
Responsible Entity	
Estimated Cost	
Resources	

Protecting **Future** Residents and Property

Action	
How is action NFIP Compliant?	
Priority (High, Medium, Low)	
Timeframe (Year)	
Potential Funding Sources	
Responsible Entity	
Estimated Cost	
Resources	

Protecting **Current** Residents and Property

Action	
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Resources	

Protecting **Future** Residents and Property

Action	
How is action NFIP Compliant?	
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Protecting **Current** Residents and Property

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Timeframe (Year)	
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Protecting **Future** Residents and Property

Action	
How is action NFIP Compliant?	
Priority (High, Medium, Low)	
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Potential Funding Sources	
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